NOAA's Gray's Reef National Marine Sanctuary

Shades of Gray

VOLUME 1, NUMBER 3 FALL 2004

Possible New Species of Sea Squirts Discovered in Gray's Reef Sanctuary

Three previously unknown sea creatures have been found at Gray's Reef by Georgia Southern University scientists working here to document all the invertebrates living at the sanctuary.

The creatures are types of sea squirts — also known as tunicates — bottom dwelling invertebrate animals that are part of the rich diversity of species found at the sanctuary.

"The fact that the three animals have never before been described by science and may well be new species is an exciting discovery," said Gray's Reef Sanctuary Manager Reed Bohne. More samples will have to be examined before scientists can definitively say they have a new species, but the animals are unlike any known tunicates.

"It makes you wonder if these species exist in other places. It suggests that we have something unique to Gray's Reef," said Daniel Gleason, associate professor of biology at Georgia Southern University. "That makes it even more worthwhile to conserve that habitat."

Gleason and fellow GSU scientists Alan Harvey and Stephen Vives have worked for three years to document all the invertebrates at Gray's Reef in a field guide. So far, 350 specimens have been collected and photographed. The guide will eventually be available on line for use by both other scientists and recreational divers who are interested in identifying what they see at Gray's Reef.

This undescribed aplidium, a tunicate or sea squirt, was discovered by marine biologist Danny Gleason and four of his students from Georgia Southern University at Gray's Reef this summer.

The new tunicates were collected by Gleason and four students – Lauren Wagner, Rob Ruzicka, Chris Freeman, Sarah Mock — under a special permit to conduct scientific work in the sanctuary. It is against sanctuary regulations to collect invertebrates from the sanctuary without a permit.

When Gleason and his students could not fully identify the mysterious tunicates, they turned to Russian tunicate expert Karen Sanamyan for assistance. Out of dozens of samples from Gray's Reef, Sanamyan identified the three as being previously undescribed species.

Among all the invertebrates — animals without backbones — tunicates are more closely related to mankind than any others, Gleason said. Both tunicates and humans are members of the broad class of living creatures called chordates that at some time during their lifecycles share a number of physical features including neural cords that run the length of their bodies. In humans, the feature is expressed in the presence of the spinal cord.

The science being done by Gleason and his students is just one example of the variety of uses that are balanced within the management of the sanctuary.

First Savannah Ocean Film Festival Extravaganza a Box Office Hit

More than 1,600 adults and children flocked to three day's worth of films and videos at the Savannah Ocean Film Festival sponsored by Gray's Reef in September.

Some 25 films with ocean-oriented themes were screened at this first-ever east coast all-ocean film festival. This special, community-wide event brought together the sanctuary, the National Marine Sanctuary Foundation, the Savannah College of Art and Design, the Tybee Island Marine Science Center and several other local partners and Gray's Reef volunteers.

The ocean film festival hit a special note with parents.

"Please keep having this film festival. As the kids get older, they will appreciate it more, but this really sparks their interest now," said Mark Manocha who attended the festival with his three children.

Highlighting the evening screenings were films by ocean videographer Bob Talbot and an award-winning animated documentary about early ocean science by director David Lebrun. Both directors introduced their films on opening night and later discussed the movies with the audience.

On the following night, two films by Jean-Michele Cousteau received their North American premiere in Savannah. These films chronicled the real-life efforts to return the Ocra whale Keiko, of "Free Willy" fame, to his native waters off Iceland. After the films, Gray's Reef staff and Georgia Department of Natural Resources marine mammal expert Clay George answered audience questions about whales.

Both Jean-Michel Cousteau and Bob Talbot are members of the board of directors for the National Marine Sanctuary Foundation.

On Sunday, a special day of children's programming combining videos, hands-on experiences and popcorn was held at the Tybee Island Marine Science Center. The center is a Gray's Reef exhibit partner.

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NOAA's Gray's Reef National Marine Sanctuary
SHADES OF GRAY

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We welcome comments and will consider publication of items submitted by readers as space permits.

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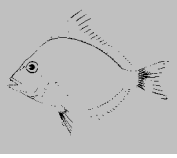

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The goal of the festival was to spark discussion about the health of the oceans and our relationship to them as well as raise awareness about Gray's Reef and the sanctuary system. Films provided an engaging way to do both.

The marquis on Trustees Theater announces the Ocean Film Festival.

"Film and video have been the most powerful force in revealing the complexity and beauty of our underwater world," said Sanctuary Manager Reed Bohne. "From the pioneering images of Jacques Cousteau to today's IMAX and digital imagery, our generation can explore the ocean frontier as never before. Gray's Reef brought this festival of ocean films to Savannah to celebrate marine conservation worldwide and to encourage commitment to sustaining healthy oceans and coasts."

Savannah's own Puppet People entertained the crowds on opening night.

From the Sanctuary Manager

By Reed Bohne, Sanctuary Manager

Bringing the Reef Ashore

One of the most difficult aspects of managing an area 20 miles offshore and 70 feet deep is making this underwater world accessible to those that may not dive or who turn green at the prospect of rolling about in the middle of the ocean accompanied by the occasional sweet scent of engine exhaust.

Most find the ocean awe-inspiring, but some would rather observe its magnificence from shore or perhaps be armchair explorers through books and film. In this issue of Shades of Gray we touch on some of the ways we have tried to bring the reef ashore recently. It is an opportunity to widen the circle of interest in the sanctuary and do so with innovative and creative people in our community.

The September Savannah Ocean Film Festival was a great example of community partnership, creating an exciting new event for our region. The concept of a film festival devoted to ocean issues and themes is new in our country. This kind of film festival has been held in Europe for nearly 30 years, but the first of its kind in the U.S. took place in California, a year ago with the help of our sister sanctuary the Gulf of the Farallones. Gray's Reef dove into the first such festival on the east coast and it was a wonderful event. The success was made possible only through the partnership with the Savannah College of Art and Design, Savannah Morning News, WSAV television and the National Marine Sanctuary Foundation.

While cinema is a great way to capture ocean enthusiasts, there are other opportunities described in this newsletter that range from teacher and student collaborations through the National Geographic Society, volunteer efforts on land and underwater with our good friends at REEF, and engaging the accidental tourist at Fernbank Museum of Natural History with a revitalized Gray's Reef diorama.

These events and our volunteers energize us. They are the best of what this program represents and hopes to be. Hope you enjoy reading about their adventures.

POSTCARDS FROM THE FIELD: Students & Teachers Share What They Learn About the Ocean

Twelve students, 12 teachers and 12 cameras added up to the first ever National Geographic Field Study course at Gray's Reef. The results of the July "Rivers to Reefs" trip sponsored by National Geographic magazine and NOAA gave students and their teacher/mentor partners a once-in-a-lifetime coastal and ocean experience that will ripple outward for years to come.

"We all share the same ocean, even those of us who live in land-locked states," said students Bridget Murphy, Minneapolis, Minn., and Brandon "Boone" Wilkinson, Portland, Ore., during photographic presentation that wrapped up the course. Learning to take photos, using the photos to tell stories and to interpret the environment was one of the results of the project. Other results were less concrete but even more lasting.

"He's never been on an airplane before, never seen the ocean before. He'll remember this for the rest of his life," Margaret Gorcycia, a district science coordinator from Texas, said of her student partner David Day.

The teachers chose their student partners from among the best in their schools. Academics counted, but so did character, a willingness to learn, and openness to new experiences, said Gorcycia.

The teams engaged in everything from kayaking the Altamaha River to operating the Gray's Reef remotely operated vehicle (ROV), to visiting coastal barrier islands. The program essentially followed the Gray's Reef "River to Reefs" curriculum, which shows the interconnectedness of the inland watershed to the ocean environment. The curriculum, prepared by Gray's Reef Education Coordinator Cathy Sakas and education volunteer Sue Chaplin-Ebanks, is in the final stages of development.

The partner pairs learned the basics of photography from National Geographic experts and used their pictures to make a photo journal presentation about their impressions of the coast. All that was asked of the participants was that they spread the word about what they had seen when they got back home. Articles about the adventure ended up in hometown papers and in publications like the Indianapolis Zoo Magazine where Educator Heidi Hutchinson wrote about how she and ZooTeen intern Darrel Jones reacted to the trip.

"Our trip was based on driving home the concept that even residents of a land-locked state populated by people that may never see an ocean have an impact own water everywhere," Heidi wrote in Indianapolis Zoo Magazine.

One student, ninth-grader Junko Kondo, wrote a description of her trip that was published in the News Tribune of Tacoma, Wash.

"I think this was the best experience of my whole entire life," Junko wrote in her News Tribune story. "We kayaked, we swam. I learned an incredible amount about the history, geology and culture. I also learned how fast people can bond together," she continued. "I was inspired to help out in environmental cleanups back home and share what I learned with others."

Students Carlos, Junko and Shauna flank teacher Mike as they take a break on the Altamaha River during their first day of the National Geographic Field Study at Gray's Reef National Marine Sanctuary. The intrepid paddlers covered 10 miles of the river over a four hour period. They made frequent stops to catch their breaths and conduct water quality monitoring profiles.

Teachers Erin and Kim investigate the tiny benthic infuana living in the sand oon Little Tybee Island's north beach. The pair along with the rest of the student and teacher participants used high tech scientific equipment— sandbox sand sieves— to sample the beach for the barley kernel-sized critters.

Students Junko and Darriel wait their turn as photographic instructor Kathleen peeks through their microscope at the Sapelo Island NAtional Estuarine Research Reserve's education center. They are scrutinizing fouling organisms gathered from the dock on Sapelo Island.

Exhibit Updates:
Gray's Reef for Land Lovers!

by William Bevil, Vice President of Exhibitions, Fernbank

When I first started working for Fernbank Museum of Natural History in Atlanta about five years ago, I was a real novice when it came to the topic of coastal Georgia and Gray's Reef National Marine Sanctuary. Although I'd traveled all over the state and seen many of its natural wonders on dry land, I was still relatively ignorant of the little gem known as Gray's Reef. My lack of familiarity with the site was not a total surprise since Gray's Reef is not the kind of place you can get out of your car and hike to. It takes a long boat trip and some scuba diving to get there. This is one of the reasons that many Georgians, don't know very much about this important ecological site right in their backyard.

The more I learned about Gray's Reef, the more fascinated with it I became. I wanted to tell other people all about it. Fortunately, I work in a perfect place to do just that – a natural history museum.

About two years ago, the Fernbank exhibits team, partnering with our friends at NOAA's Gray's Reef National Marine Sanctuary, set out to make significant improvements to our Gray's Reef exhibits. Our goal was to create the most realistic replica of the reef ever seen in an exhibit setting. We also wanted to provide as much interpretive / educational information as we could to further enhance the visitor experience.

To do this, we first had to reconstruct the reef itself, using concrete and foam to fabricate sculpted rock ledges and overhangs just like those found at the site. Sandy open areas, another habitat feature of the reef, where included with an eye towards providing a place to put our open-water and sandy bottom animals.

Next, all of the hard rock surfaces and ledges were literally covered with sessile invertebrates and plants. We wanted the diorama to convey the intense competition that occurs between species for every square inch of exposed rock. Some of the invertebrates we chose to show were vase sponges, finger sponges, sea whips, anemones, urchins, sea stars, squid, octopus, and a very cool spiny lobster

Fish are an important part of Gray's Reef's ecosystem, and we have lots in our diorama. Some of the more notable species which appear in the new display include the great hammerhead shark, spadefish, angelfish, squirrelfish, triggerfish, moray eel, butterfly fish, filefish, stingrays and an enormou manta ray (a giant filter feeder).

The newly refurbished diorama contains 40 specimens of animals that are found at Gray's Reef National Marine Sanctuary. While this may seem like a lot, there are actually hundreds of documented species at GRNMS.

From an interpretive standpoint, the new diorama has several features that enhance its appearance and functionality as an exhibit component. There are three new graphics stations in front of the display, incorporating everything from video footage of the reef to a "Field Notebook" with details about the reef and the animals in the display. A center exhibit key identifies each of the specimen models along with their scientific names.

On the technical side, we made some changes that are designed to extend the life of the display and protect the new specimens. First and foremost is the addition of glass in front of the display. Many of the specimens are very fragile and need to be protected from curious hands. But the glass isn't just a barrier—it also increases the illusion that the viewer is looking into and underwater world. New water motion effect lights further enhance the illusion.

Telling the story of the reef's prehistoric past was of major interest to our museum. To meet this need, we included cast reproductions of actual paleontological specimens collected from the reef, shedding light on the region's natural history and adding a layer of depth to the subject matter.

The findings at Gray's Reef shed new light on many facets of natural history on the Georgia coast and relate to many disciplines, including: geology, paleontology, archaeology, marine biology and global marine ecology. Using Gray's Reef as a topic in our exhibitions provides an opportunity for exploration of many fields under one subject umbrella. Put simply, Gray's Reef fits our mission perfectly.

We're very proud of the new exhibit here at Fernbank, and wish to thank Gray's

Continued on page 6

The before and after of the Fernbank diorama shows the work done to update the exhibit.

Photo: Courtesy of Fernbank

Volunteers Honored For Hard Work, Long Hours

They sell t-shirts. They brave the deck of pitching ships to look for tiny birds. They dive, they write curriculum material—they are the Gray's Reef volunteers. During the Savannah Ocean Film Festival, the staff of Gray's Reef took time to honor volunteers for their dedication and support at a special reception. Here's what Sanctuary Manager Reed Bohne had to say about them:

Sue Chaplin-Ebanks

Sanctuary Manager Reed Bohne presents an award to volunteer Sue Chaplin-Ebanks.

In the fall of 2003, Sue Chaplin-Ebanks first came to Gray's Reef to fulfill a requirement for her Masters of Science degree at Savannah State University. She asked for a project on which she could spend at least 40 hours over the course of a semester. Her work on that project has now far exceeded that initial 40 hours. In fact, she has spent at least four times that amount in completing the project of which she has now grown so fond that she just simply can't quit!

Sue is working with Education Coordinator Cathy Sakas to bring a comprehensive oceanography curriculum to middle and high school grades where none currently exists. She has helped create several activities dealing with ocean floor topography and the comparison of Earth's land masses to ocean expanses. Sue has done a beautiful job of juggling her studies with her volunteer efforts at Gray's Reef while being a full time mom to Junpei and wife to Dwight.

Sue is a model volunteer who has brought her academic intellect and creative ideas to help out with the daunting task of creating intriguing lessons and engaging activities in ocean science. She adds her warm smile and easy going manner to our winsome team of awesome volunteers.

Ralph Neely

Sanctuary Manager Reed Bohne presents an award to volunteer Ralph Neely.

Dive shop owner Ralph Neely is an energetic and knowledgeable local diving expert who goes above and beyond any normal sense of business to help support sanctuary activities at Gray's Reef. From working late to fill tanks, to waking early to deliver them to the dive site, Ralph's dedication and knowledge are indispensable. Always ready with good advice and service, Ralph and his merry band at Zero Gravity dive shop are truly friends of Gray's Reef NMS.

Russ Wigh

Volunteer Russ Wigh at work cataloging birds at Gray's Reef.

Russ Wigh is an entrepreneur, woodworker, professor, writer, lecturer, photographer, guide, birder and somehow still finds time to mow his own lawn! At Gray's Reef, he has found his niche as our pelagic bird expert. To completely profile our reef system, we realized that looking at the surface and beneath did not tell the complete story. We needed to characterize what was happening above the surface as well.

With Russ' help, many species of birds have been identified hovering, diving and feeding in the waters of Gray's Reef. It takes a rare constitution to be offshore on a pitching, yawing boat while looking through binoculars to scope out the often minute identifying marks on a flying bird. This work is not for the weak of stomach! Russ actually relishes his time spent offshore, and we are glad for it! His expert eye, upbeat spirit and quick wit keeps him in good standing on our small but mighty team of amiable volunteers.

Samantha Bonnell

Sanctuary Manager Reed Bohne presents an award to volunteer Samantha Bonnell

Samantha Bonnell was one of the very first volunteers ever recruited for the sanctuary. She began supporting the Gray's Reef OceanFest several years ago and has done so for several years in succession. Samantha repeatedly rallied students and occasionally a professor to make the Kids Art and Poetry Contest a delightful and colorful part of OceanFest. In this past year, Samantha single-handedly represented Gray's Reef at the Georgia Southern University Earth Day celebration when it was impossible for any staff to be present.

Savannah Scuba Club

Savannah Scuba is a group of fellow dive enthusiasts, with a wide range of experience levels, which gather to share in fellowship and learning experiences. Andrea Hillis

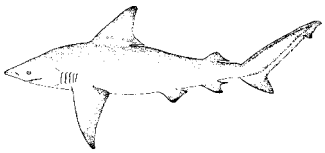
Continued on page 6

Volunteer's *continued from page 5*

has often directed that fellowship to Gray's Reef by inviting staff to speak at club meetings, participating in public hearings, and organizing reef cleanups. Club members were a tremendous support to the Gray's

Sanctuary Manager Reed Bohne presents an award to members of the Savannah scuba club.

Reef staff during the Savannah Ocean Film Festival. We are grateful for their support and for helping to keep the area dive community informed about Gray's Reef.



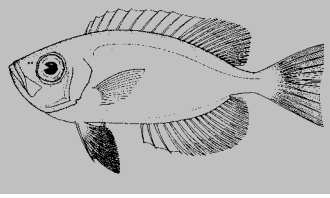
Exhibits *continued from page 5*

Reef National Marine Sanctuary for their assistance in making it possible to construct such an impressive display. Thanks to their support, Fernbank now has a very special exhibit that provides a unique visitor experience aimed at improving our knowledge of Georgia's beautiful and fragile coastal reefs. And, they don't even have to get wet to enjoy it.

Sea Stars: People Who Shine at Gray's Reef

Kerry Nelson, former Gray's Reef Student Ocean Council member, achieved Eagle Scout status recently and cited his experience at the sanctuary as playing a part in his accomplishment.

Gray's Reef education volunteer Sue Chaplin-Ebanks' brother Oscar Chaplin III finished 10th at the Olympics in Athens in weightlifting in the 85kg division.



More Exhibit Updates

Tybee Island Marine Science Center-has installed a new 800 gallon tank representative of the habitat and creatures of Gray's Reef; new graphic panels interpreting the sanctuary for visitors are also up.

The South Carolina Aquarium-has installed a special communications system so divers can talk to visitors about the Gray's Reef habitat; new graphic panels are on the way and there are plans for a totally new interactive Gray's Reef exhibit.

The Georgia Southern Museum-has plans to add a permanent exhibit about Gray's Reef to its refurbished great hall exhibits; the entire great hall will focus on past and present coastal seas.

University of Georgia Marine Education Center and Aquarium-is in the planning stages of an entirely new Gray's Reef exhibit.

The One, Two, Threes of Fish: REEF Volunteers Count Fish at Gray's Reef

Nobody knows how many fish swim in the sea, but researchers are getting a better idea how many spend time at Gray's Reef.

Six volunteer divers from the Reef Environmental Education Foundation or REEF spent a week this summer counting and measuring fish at the sanctuary.

Armed with clipboards, waterproof paper, pencils, and laser pointers, the divers worked from the sanctuary's boat, the Joe Ferguson. They noted what fish they saw, how many, and how big.

Over the past 11 years, REEF volunteer divers have submitted just over 20,000 surveys from eight national marine sanctuaries, including Gray's Reef. In 2003, a total of 3,413 surveys were processed by REEF, submitted by 528 volunteers. But at Gray's Reef this summer, they were trying something different— a new census methodology, which will gather information on abundance and size class distribution of fish in the managed snapper/grouper complex. Some fish in this group are often identified as over-fished and are of particular concern to marine resource and fisheries managers.

Gray's Reef National Marine Sanctuary contracted REEF to do the survey for a simple reason, said executive director Lad Akins.

"If you want to manage a resource, you have to know what you have," he said.

The ledge the divers focused on harbored barracudas, Spanish mackerels, blue runners, nurse sharks and goliath groupers—a protected species.

For the volunteers who used vacation and personal time to do the survey, the reward was a wealth of diving opportunity - three dives each day for a week. Each surveyor is an accomplished diver who's already completed at least 35 REEF fish surveys to become part of this advanced team.

Among the group was a biologist with the South Carolina DNR and a dive master from the Florida Keys. But even the divers who work with fish all the time are awed

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The One, Two, Three's:REEF Volunteers Count Fish at Gray's Reef continued from page 6

by Gray's Reef. That was the case with Arnold Postell, who is the dive safety officer for the South Carolina Aquarium in Charleston, a Gray's Reef exhibit partner.

"It was hard to keep my mind on the survey, the fish were just too fantastic," he said.

New NOAA Corps Officer Join's Gray's Reef

Lt. j.g. Keith Golden, a National Oceanic and Atmospheric Administration Corps officer, has joined the staff of Gray's Reef National Marine Sanctuary. Golden is responsible for boat and dive operations at the sanctuary.

Golden arrived at Gray's Reef after a 2 and ½ year sea assignment aboard the NOAA ships Oscar Elton Sette and Townsend Cromwell, both berthed in Honolulu.

Originally from Xenia, Ohio, Golden graduated from Ohio University with a B. S. degree in marine biology. He enlisted in the United States Air Force after high school and spent four years on active duty. In 1996, he joined the Ohio Air National Guard. Golden is involved with local adult soccer and softball leagues and will coach high school soccer in the spring. He is married and lives in Pooler.

The Fishing is Good, the Habitat is Terrific: Why Both Fish and Fisherman School to Gray's Reef

The fishing is great at Gray's Reef.

Every angler who visits the sanctuary says so. An August 12th article in the Brunswick News titled "Marine Sanctuary produces great kingfish bite" said so too. The story by Bud L. Ellis went on to list several big and record catches taken at the sanctuary this summer and last: a 75-pound, 12-ounce king that shattered the state record by more than 12 pounds; a 46-pound king and a 44.3-pound king captured in July; and last year's winning catch in the Golden Isles Kingfish Classic, a 51.19-pound whopper, the largest in the nine-year history of the Classic.

"That's good fishing," said one Georgia angler quoted in the Ellis story.

The story went on to say how the sanctuary is now attracting anglers from all over the east coast—Gray's Reef is no longer the secret fishing spot of Georgia fishermen alone.

While the fishermen ply the waves in search of the kingfish of their dreams, it is what is beneath the surface that draws the fish in—the most outstanding example of live-bottom habitat in the southeast.

The rocky outcrops and ledges scattered throughout the 17-square nautical mile sanctuary provide food and cover for a variety of small fish. The small fish are in turn prey for larger fish, including pelagic species like kingfish and Spanish mackerel. The record-setting big fish simply wouldn't be there if not for the little fish using the ledge habitat.

Yet scientists using up-to-the-minute bottom mapping techniques have recently determined that the critical ledge habitat covers less than 1 percent of the 11,000 acre sanctuary; far less than was originally thought.

In between the ledges, the sandy bottom of the sanctuary hosts a stunning variety of benthic creatures—the worms and other crawly creatures that are food for the little fish.

"Managing this remarkable resource for the benefit of all its living resources is what keeps the fishing good," said Sanctuary Manager Reed Bohne.

Keeping the resources of the sanctuary healthy for the long term is the goal of a series of workshops for the Sanctuary Advisory Council working group that is investigating a possible recommendation to create a research area at the sanctuary. The working group met for a second time in October and will meet again in February.

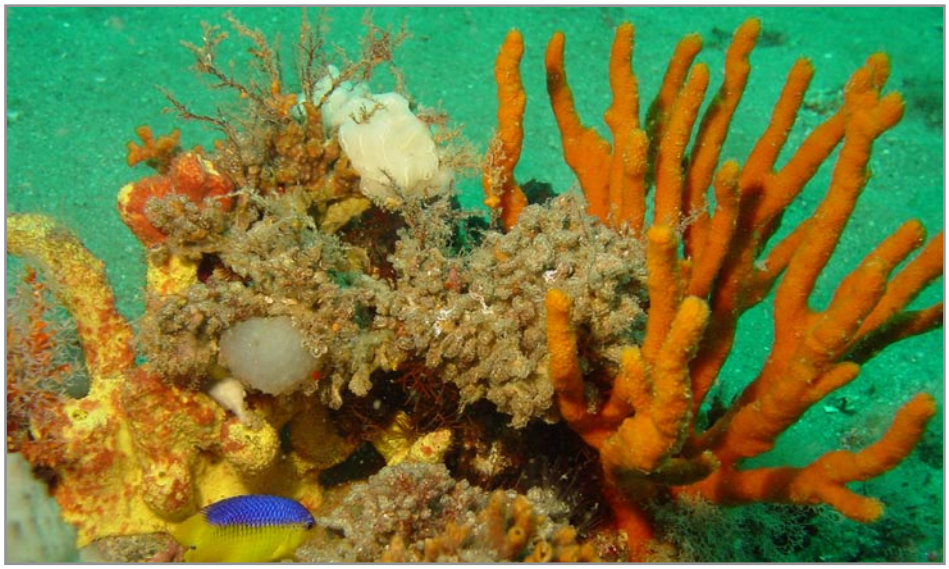
The purpose of the workshops is to help define the concept, identify the scientific needs for a research area and identify several design options. The 18-member working group consists of council members, recreational anglers, recreational divers, and regional scientists.

All ideas developed are drafts only.

In February the working group may decide whether or not to recommend to the full council that a research area be evaluated through an environmental impact statement. The council would then consider the recommendation of its working group and make a determination for their recommendation to the sanctuary manager.

Such an area, if it were to be adopted, would be a first within the Sanctuary Program and would likely take until 2007 to clear public process and the National Environmental Policy Act requirements.

Managing the resources of Gray's Reef for visitor use, for scientific study, for education and for recreation is a balancing act—one designed to ensure its health in the future.



The diverse life under the sea is what attracts prize winning game fish to Gray's Reef.

NOAA's Gray's Reef National Marine Sanctuary

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About Gray's Reef National Marine Sanctuary

NOAA's Gray's Reef National Marine Sanctuary was established in 1981 to protect one of the largest nearshore live-bottom reefs off the southeastern United States. The sanctuary is located about 17 miles east of Sapelo Island, Georgia and encompasses 17 square nautical miles.

An estimated 160 species of fish have been recorded at Gray's Reef; approximately 33 species spawn there. The ledges and overhangs of the reef serve as resting and foraging areas for threatened loggerhead sea turtles, which nest on nearby barrier islands. Gray's Reef is near the critical habitat area and only known calving ground for the highly endangered Northern right whale. Pelagic sea birds and shore birds feed on schooling baitfish within sanctuary waters. The sanctuary is well known to the recreational divers and fishers who visit it.

The mission of the National Marine Sanctuary Program is to serve as the trustee for the nation's system of marine protected areas to conserve, protect and enhance their biodiversity, ecological integrity and cultural legacy.

For more information, contact NOAA's Gray's Reef National Marine Sanctuary offices at
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Visit us at graysreef.noaa.gov